

1. An insecticidal protein comprising the sequence:
 $X_1X_2ICTPAGVKCPAALPCCPGLRCIGGVNNKVR$ (SEQ ID NO: 1) wherein X_1 and X_2 are any amino acid.
2. An insecticidal protein according to claim 1 wherein X_1 and X_2 are selected from the group consisting of: Glycine; Lysine; Serine; Tyrosine; Alanine; Methionine; Threonine, Glutamic acid; Aspartic acid; Asparagine and Valine.
3. An insecticidal protein according to claim 2 comprising the sequence: $GKICTPAGVKCPAALPCCPGLRCIGGVNNKVR$ (SEQ ID NO: 2).

4. An insecticidal protein having at least 55% identity to a protein according to claim 1.
5. An insecticidal protein having at least 70% identity to a protein according to claim 1.
6. An insecticidal protein according to claim 1 wherein the amino acid at position X_1 is modified.
7. An insecticidal protein according to claim 6 wherein the amino acid at position X_1 is acetylated.
8. An insecticidal protein according to claim 6 wherein the amino acid at position X_1 is at the N-terminus.

9. A polynucleotide encoding a protein according to claim 1.
10. A polynucleotide sequence which is the complement of one which hybridises to a polynucleotide according to claim 9 at a temperature of about 65°C in a solution containing 6 x SSC, 0.01% SDS and 0.25% skimmed milk powder, followed by rinsing at the same temperature in a solution containing 0.2 x SSC and 0.1% SDS wherein said polynucleotide sequence still encodes an insecticidal protein.
11. A polynucleotide sequence according to claim 10 comprising the sequence depicted as SEQ ID NOS: 4 to 14.

12. An insecticidal synergistic combination comprising a first protein according to claim 1 and at least one further protein.

13. A combination according to claim 12 wherein said further protein is an insecticidal CRY protein.

14. A combination according to claim 13 wherein the said further protein comprises a sequence selected from the group consisting of SEQ ID NOS: 54 to 59.

A3 15. A polynucleotide which comprises regions encoding the first and further protein according to claim 12.

16. A polynucleotide according to claim 15 wherein the region encoding said first protein comprises a sequence selected from the group depicted as SEQ ID NOS: 4 to 14.

17. A method of evolving a polynucleotide which encodes a protein having insecticidal properties comprising:

(a) providing a population of variants of said polynucleotide and further polynucleotides which encode further proteins, where at least one of said polynucleotides is in cell free form; and

(b) shuffling said variants and further polynucleotides to form recombinant polynucleotides; and

(c) selecting or screening for recombinant polynucleotides which have evolved towards encoding a protein having the said insecticidal properties; and

(d) repeating steps (b) and (c) with the recombinant polynucleotides according to step (c) until an evolved polynucleotide which encodes a protein having insecticidal properties has been acquired wherein said population of variants in part (a) contains at least a polynucleotide according to claim 9.

18. A method according to claim 17 wherein said population of variants in part (a) contains at least a polynucleotide encoding the protein depicted as SEQ ID NO: 1 to 3 and/or said further polynucleotides in part (a) encode a CRY protein.

A4 19. A polynucleotide obtainable or obtained by the method according to claim 17.

20. A protein encoded by a polynucleotide according to claim 19.

96
21. A DNA construct comprising in sequence a plant operable promoter operably linked to a polynucleotide according to claim 9.

22. A DNA construct according to claim 21 which further comprises a region which provides for the targeting of the protein product to a particular location.

23. A DNA construct according to claim 21 which further comprises a region which provides for the production of a protein which acts as a selectable marker.

24. A DNA construct according to claim 21 wherein the plant operable promoter is selected from the group consisting of *Agrobacterium rhizogenes* Rld; potato protease inhibitor II; CaMV35S; FMV35S; NOS; OCS; Patatin; E9; alcA/alcR switch; GST switch; RMS switch; oleosin; ribulose bisphosphate carboxylase-oxygenase small sub-unit promoter and other root specific promoters including MR7 promoter (maize); Gos 9 (rice) and GOS2 promoters.

25. A method of providing a plant or plant part with an insecticidal protein or an insecticidal synergistic combination comprising:

(a) inserting into the genome of plant material a polynucleotide according to claim 9; or

(b) inserting into the genome of plant material which is capable of producing a further protein, a polynucleotide according to claim 9; or

(c) inserting into the genome of plant material which is capable of producing a protein according to claim 1; and

(d) regenerating plants or plant parts from said material; and

(e) selecting the plants or plant parts having said protein or combination.

26. A method of providing a plant with a combination according to claim 12 comprising crossing a first plant which is capable of providing a first protein according to claim 1 with a second plant which is capable of producing a further protein and selecting the resultant plant which is capable of producing said combination.

A1
27. Plants or plant parts obtained according to the method of claim 25.

28. Plants or plant parts according to claim 27 wherein said protein or the first protein of said combination is post translationally modified.

29. Plants or plants parts according to claim 28 wherein said protein or the first protein of said combination is acetylated.

30. Plants or plant parts according to claim 28 wherein said protein or the first protein is modified/acetylated at the N-terminus.

31. Plants or plant parts according to claim 27 selected from the group consisting of melons, mangoes, soybean, cotton, tobacco, sugarbeet, oilseed rape, canola, flax, sunflower, potato, tomato, alfalfa, lettuce, maize, wheat, sorghum, rye, bananas, barley, oat, turf grass, forage grass, sugar cane, pea, field bean, rice, pine, poplar, apple, peaches, grape, strawberries, carrot, lettuce, cabbage, onion, citrus, cereal, nut plants or other horticultural crops.

G8
32. A method of providing a plant or plant part with a further desired agronomic trait comprising:

(a) inserting into the genome of plant material a polynucleotide which provides for the desired agronomic trait; and

(b) regenerating plants or plant parts from said material; and

(c) selecting the plants or plant parts having said desired agronomic trait wherein said plant material is capable of producing an insecticidal protein according to claim 1.

33. A method according to claim 32 wherein the further desired agronomic trait is selected from the group consisting of: herbicide resistance; insect resistance; nematode resistance; stress tolerance; altered yield; altered nutritional value or any other desirable agronomic trait.

34. Plants or plant parts obtained according to the method of claim 32.

35. An insecticidal protein comprising the sequence depicted as: -X₁-X₂-X₃-Cys₄-X₅-X₆-X₇-X₈-X₉-X₁₀-Cys₁₁-X₁₂-X₁₃-X₁₄-X₁₅-X₁₆-Cys₁₇-Cys₁₈-X₁₉-X₂₀-X₂₁-X₂₂-Cys₂₃-X₂₄-X₂₅-X₂₆-X₂₇-X₂₈-X₂₉-X₃₀-X₃₁-Cys₃₂-X₃₃- (SEQ ID NO: 60) wherein X₁₋₃, X₅₋₁₀, X₁₂₋₁₆, X₁₉₋₂₂, X₂₄₋₃₁ and X₃₃ is any amino acid.

36. An insecticidal protein having a FASTA opt score greater than 109 when compared with SEQ ID NO: 1 using FASTA algorithm Version 3.

37. An insecticidal protein obtainable from *Paecilomyces sp.*

38. An insecticidal protein according to claim 37 obtainable from *Paecilomyces farinosus*.

39. A method of controlling insects comprising providing at a locus where the insects feed a protein according to claim 1.

40. Use of a polynucleotide according to claim 9.

41. Use of a protein according to claim 1.

42. Use of a *Paecilomyces Sp.* in the preparation of a pesticide containing as an active ingredient a protein according to claim 1.

43. Use according to claim 42 wherein said *Paecilomyces Sp.* has been modified to allow for increased production of a protein according to claim 1.

44. A recombinant micro-organism which provides for production of a protein according to claim 1.

45. A recombinant baculovirus which comprises a protein according to claim 1.

46. Use of a baculovirus according to claim 45 in a method of controlling insects.

47. An insecticidal protein which is capable of reacting with a monoclonal antibody raised to the protein depicted as SEQ ID NO: 1.

48. A composition comprising an insecticidally effective amount of a protein according to claim 1.

49. A polynucleotide comprising a first region encoding an insecticidal protein according to claim 1.

50. A plant cell comprising a protein according to claim 1.

51. An insecticidal protein comprising the motif depicted as -LPCCPG- (SEQ ID NO: 63).